Published International Standards Developed by ISO/IEC JTC 1/SC 37 - Biometrics

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Biometric Technical Interface Standards			
Developer	**Standard**	**Title**	**Description**
ISO/IEC JTC 1/SC 37	ISO/IEC 19784-1:2006	Information technology - Biometric Application Programming Interface – Part 1: BioAPI Specification	This standard provides a defined interface that allows a software application to communicate with (utilize the services of) one or more biometric technologies. It includes a high-level generic biometric authentication model suited to a broad range of biometrically enabled applications and to most forms of biometric technology. An architectural model is described which enables components of a biometric system to be provided by different vendors, and to interwork through fully-defined Application Programming Interfaces (APIs), corresponding Service Provider Interfaces (SPIs), and associated data structures. The BioAPI specification covers the basic biometric functions of enrollment, verification, and identification and includes a database interface to allow an application to manage the storage of biometric records. Conformance requirements are identified and informative annexes, including sample code, is provided. This standard specifies a biometric data structure which is compatible with ISO/IEC 19785 and 19794.
ISO/IEC JTC 1/SC 37	ISO/IEC 19784-2:2007	Information technology - Biometric Application Programming Interface – Part 2: Biometric Archive Function Provider Interface	This part of the standard describes the interface between a BSP and a biometric archive function provider. A biometric archive function provider encapsulates all functionality for the storage, search and management of biometric reference data regardless of the kind of physical storage media. Using a biometric archive function provider a BSP does not have to take care for special handling of different storage media like database servers, smartcards, database web services etc. Whatever media is used, the BSP in all cases handles the same interface for a biometric archive function provider. The interface description contains management functions to attach and detach different archive BFPs, to query biometric data records and to store biometric data records.
ISO/IEC JTC 1/SC 37	ISO/IEC 19785-1: 2006	Information technology - Common Biometric Exchange Formats Framework (CBEFF) - Part 1: Data Element Specification	This part of the standard defines a basic structure for standardized biometric information records (BIRs) that consists of three parts, the standard biometric header (SBH), the biometric data block (BDB), and the security block (SB). CBEFF also defines several data elements and their standardized abstract values that can be used in SBHs and SBs (CBEFF treats the BDB as opaque data). CBEFF also establishes mechanisms by which organizations, called “patrons” by CBEFF, can specify and publish BIR format specifications, which are in turn called “patron formats.” CBEFF enables patrons to develop BIR specifications that are fully standardized and interoperable, yet are specifically adapted

			to the requirements of a particular application environment. CBEFF defines rules for BIRs that contain only one BDB (simple BIR) and that contain at least one BDB (complex BIR). CBEFF defines mandatory data elements that identify the format of a BDB and its security attributes (encryption and integrity). All the other CBEFF-defined data elements and abstract values are optional. CBEFF enables patrons to define additional data elements and abstract values as required by the application environment.
ISO/IEC JTC 1/SC 37	ISO/IEC 19785-2: 2006	Information technology - Common Biometric Exchange Formats Framework (CBEFF) - Part 2: Procedures for the Operation of the Biometric Registration Authority	This part of the standard specifies procedures for a Registration Authority that is responsible for the assignment of ASN.1 object identifier components to identify biometric organizations, CBEFF patrons, security block formats, biometric data block formats, biometric information record formats and biometric products, to provide globally unambiguous identification in the context of the CBEFF ASN.1 object identifier.

Biometric Data Interchange Format Standards

Developer	Standard	Title	Description
ISO/IEC JTC 1/SC 37	ISO/IEC 19794-1: 2006	Information technology -- Biometric data interchange format – Part 1: Framework	ISO/IEC 19794 - Information technology -- Biometric data interchange formats is multi-part standard. This part of the standard describes the general aspects and requirements for defining biometric data interchange formats. The notation and transfer formats provide platform independence and separation of transfer syntax from content definition. This standard defines what is commonly applied for biometric data formats, i.e. the standardization of the common content, meaning, and representation of biometric data formats of biometric types considered in the specific parts of the multipart standard.
ISO/IEC JTC 1/SC 37	ISO/IEC 19794-2: 2005	Information technology - Biometric data interchange format - Part 2: Finger minutiae data	This part of the standard specifies a concept and data formats for representation of fingerprints using the fundamental notion of minutiae. The standard is generic, in that it may be applied and used in a wide range of application areas where automated fingerprint recognition is involved. The Standard contains definitions of relevant terms, a description of how minutiae shall be determined, data formats for containing the data for both general use and for use with cards, and conformance information. Guidelines and values for matching and decision parameters are provided in an informative Annex. ISO/IEC 19794-2 specifies: the fundamental data elements used for minutiae-based representation of a fingerprint, three data formats for interchange and storage of this data: a record-based format, and normal and compact formats for use on a smart card in a match-on-card application, optional extended data formats for including additional data such as ridge counts and core and delta location. ISO/IEC 19794-2 provides for interchange of finger minutiae data between sensing, storage and matching systems.

ISO/IEC JTC 1/SC 37	ISO/IEC 19794-3: 2006	Information technology -- Biometric data interchange format -- Part 3: Finger pattern spectral data	This part of the standard specifies requirements for the representation of local or global spectral data derived from a fingerprint image. The format is designed to provide flexibility in the choice of spectral representation in that spectral components may be based on quantized cosinusoidal triplets, Discrete Fourier Transformations or Gabor filters. The format also allows for a variable number of spectral components to be retained, which enables data representations in a form that is more compact than storage of the entire fingerprint image. Example data records are provided for each of the spectral representations in informative annexes.
ISO/IEC JTC 1/SC 37	ISO/IEC 19794-4: 2005	Information technology - Biometric data interchange format - Part 4: Finger image data	This part of the standard specifies a data record interchange format for storing, recording, and transmitting the information from one or more finger or palm image areas within an ISO/IEC 19785-1 CBEFF data structure. This can be used for the exchange and comparison of finger image data. It defines the content, format, and units of measurement for the exchange of finger image data that may be used in the verification or identification process of a subject. The information consists of a variety of mandatory and optional items, including scanning parameters, compressed or uncompressed images and vendor-specific information. This information is intended for interchange among organizations that rely on automated devices and systems for identification or verification purposes based on the information from finger image areas. Information compiled and formatted in accordance with this part of the ISO/IEC 19794 standard can be recorded on machine-readable media or may be transmitted by data communication facilities.
ISO/IEC JTC 1/SC 37	ISO/IEC 19794-5: 2005	Information technology - Biometric data interchange format - Part 5: Face image data	This part of the standard specifies scene, photographic, digitization and format requirements for images of faces to be used in the context of both human verification and computer automated recognition. The approach to specifying scene and photographic requirements in this format is to carefully describe constraints on how a photograph should appear rather than to dictate how the photograph should be taken. The format is designed to allow for the specification of visible information discernable by an observer pertaining to the face, such as gender, pose and eye color. The digital image format can be either ISO standard JPEG or JPEG2000. Finally, the “best practice” appendices provide guidance on photo capture for travel documents and face recognition performance verses digital compression.
ISO/IEC JTC 1/SC 37	ISO/IEC 19794-6: 2005	Information technology - Biometric data interchange format - Part 6: Iris image data	This part of the standard specifies two alternative image interchange formats for biometric authentication systems that utilize iris recognition. The first is based on a rectilinear image storage format that may be a raw, uncompressed array of intensity values or a compressed format such as that specified by ISO/IEC 15444. The second format is based on a polar image specification that requires certain pre-processing and image segmentation steps, but produces a much more compact data structure that contains only iris information.

ISO/IEC JTC 1/SC 37	ISO/IEC 19794-8:2006	Information technology - Biometric data interchange format -- Part 8: Finger pattern skeletal data	This part of the standard describes all characteristics of a fingerprint in a small data record. Thus it allows for the extraction of both spectral information (orientation, frequency, phase, etc.) and features (minutiae, core, ridge count, etc.). Transformations like translation and rotation can also be accommodated by the format defined herein. This standard for pattern-based skeletal representation of fingerprints supports the proliferation of low-cost commercial fingerprint sensors with limited coverage, dynamic range, or resolution. Thus the standard defines a data record that can be used to store biometric information on a variety a storage mediums (including, but not limited to, portable devices and smart cards).
ISO/IEC JTC 1/SC 37	ISO/IEC 19794-9:2007	Information technology -- Biometric data interchange format – Part 9: Vascular image data	This part of the standard defines the exchange of human vascular biometric image information. It defines a specific definition of attributes, a data record format for storing and transmitting vascular biometric images and certain attributes, a sample record and conformance criteria. ISO/IEC 19794-9:2007 is intended for applications requiring the exchange of raw or processed vascular biometric images. It is intended for applications not limited by the amount of storage required. It is a compromise or a trade-off between the resources required for data storage or transmission and the potential for improved data quality/accuracy. Basically, it is to enable various algorithms to identify or verify the vascular biometric image data transferred from other image sources. Currently available vascular biometric technologies that may utilize ISO/IEC 19794-9:2007 for image exchange are technologies that use the back of the hand, palm and finger.

Biometric Performance Testing and Reporting Standards

Developer	Standard	Title	Description
ISO/IEC JTC 1/SC 37	ISO/IEC 19795-1:2006	Information technology – Biometric performance testing and reporting – Part 1: Principles and framework	This part of this standard is concerned with the evaluation of biometric systems in terms of error rates and throughput rates. Metrics for the various error rates in biometric enrolment, verification and identification are unambiguously specified. Recommendations and requirements are given for the conduct of performance evaluations through the steps of planning the evaluation; collection of enrolment, verification or identification transaction data; analysis of error rates; and the reporting and presentation of results. The principles presented are generic to the range of biometric modalities, applications, and test purposes, and to both offline and online testing methodologies. These principles help avoid bias due to inappropriate data collection or analytic procedures; give better estimates of field performance for the expended effort; and clarify the limits of applicability of the test results.

ISO/IEC JTC 1/SC 37	ISO/IEC 19795-2:2007	Information technology – Biometric performance testing and reporting – Part 2: testing methodologies for technology and scenario evaluation	This part of this standard addresses two specific biometric performance testing methodologies: technology and scenario evaluation. The large majority of biometric tests are of one of these two generic evaluation types. Technology evaluations evaluate enrolment and comparison algorithms by means of previously collected corpuses, while scenario evaluations evaluate sensors and algorithms by processing of samples collected from Test Subjects in real time. The former is intended for generation of large volumes of comparison scores and candidate lists indicative of the fundamental discriminating power of an algorithm. The latter is intended for measurement of performance in modeled environments, inclusive of Test Subject-system interactions.

Conformance Testing Methodology Standards

Developer	Standard	Title	Description
ISO/IEC JTC 1/SC 37	ISO/IEC 24709.1: 2007	BioAPI Conformance Testing - Part 1: Methods and Procedures	This part of this standard specifies the concepts, framework, test methods, and criteria required to test conformity of biometric products claiming conformance to BioAPI(ISO/IEC 19784-1). Guidelines for specifying BioAPI conformance test suites, writing test assertions, and defining procedures to be followed during the conformance testing are provided. The conformance testing methodology is concerned with conformance testing of biometric products claiming conformance to BioAPI. Definitions of schemas of the assertion language are provided in normative annexes.
ISO/IEC JTC 1/SC 37	ISO/IEC 24709.2: 2007	BioAPI Conformance Testing - Part 2: Test Assertions for Biometric Service Providers	This part of this standard defines a number of test assertions written in the assertion language specified in Part 1 of ISO/IEC 24709. These assertions enable a user of this Part 2 of ISO/IEC 24709 (such as a testing laboratory) to test the conformance to ISO/IEC 19784-1 (BioAPI 2.0) of any biometric service provider (BSP) that claim to be a conforming implementation of that International Standard. Each test assertion specified in this Part 2 of ISO/IEC 24709 exercises one or more features of an implementation under test. Assertions are placed into packages (one or more assertions per package) as required by the assertion language. These assertions allow for testing conformance of BSP's of all conformance subclasses, and are further organized according to conformance subclasses and claimed support of optional features.